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**R E P O R T**  
ON THE  
**T R E A T M E N T**  
OF  
**ACUTE AND CHRONIC**  
**DIARRHŒA,**  
WITH  
SUB-NITRATE OF BISMUTH,  
AT CAMP DOWNEY, CAL., AND FINLEY HOSPITAL,  
WASHINGTON, D. C.

**BY JOHN B. TRASK, M. D.**

ACTING ASSISTANT SURGEON, U. S. A.

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# REPORT ON THE TREATMENT OF ACUTE & CHRONIC DIARRHŒA.

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To Surgeon R. H. COOLIDGE, U. S. A., }  
Medical Director, California.

SIR :—In July, 1862, I had occasion to report to you the results of treatment of an epidemic diarrhœa at Camp Downey, California, which disease broke out among the troops belonging to the First California Volunteers at the above post. Allusion was also made to a similar epidemic occurring at Camp Sumner and Presidio in July, 1861.

This paper having been submitted to your inspection in August, 1862, at Washington, with a view to publish the same, but through the press of business in your office connected with the immediate field of active operations in that vicinity, had been laid over for more leisure time until October, and the necessity of my leaving at this period, led me to ask its return, which request you kindly granted.

The reason of that request lay in the fact that during the period elapsing between August and October, and while on service as Surgeon-in-charge of Finley Hospital, there were many additional cases of the malady that came under my supervision, which would make the report on the results of treatment on both sides of the continent (under widely different circumstances as regards the causes producing it, and the condition and health of the troops) more interesting. This fact will hold good, more particularly as regards the therapeutic action of the remedy used under such diverse circumstances as existed at both positions as alluded to above, and will, perhaps, have a tendency to throw some additional light on the peculiar specific action of the agent used.

Whatever of fault, there may be, therefore, in thus incorporating those additional cases (occurring at the Finley Hospital,) in this report to you, in place of the Surgeon-General's office, will rest on

me, and I indulge the belief that no offense will be considered as offered to that officer, when it is understood that it is simply done in this manner to facilitate comparison, and save the trouble of two separate papers on the same subject.

If this brief paper should form a part of the medical statistics of the war, to which it belongs, such facts as may be found in it of any merit will be more easily collated in the final report of the Medical Department of the Army. I trust, therefore, that this will be a sufficient explanation of the entire report appearing in its present form.

There is probably no ordinary malady to which troops are liable, that so rapidly and effectually impairs their efficiency during its prevalence as that accident familiarly known as "Camp Diarrhœa," in its acute form, or when it has assumed a chronic feature arising from the varied vicissitudes incident to a soldier's life in the field. A fact well appreciated by military surgeons is this: that the prevalence of this "camp pest" is one occurring at no regular intervals, but arises at any and all periods of camp life—in camp, bivouac, or march.

Often in camp its advent is without assignable cause, it continues for an indefinite period, is violent or mild, and it often disappears as suddenly as it made its onset; or it may continue and finally die out when the last man of the regiment has been subjected to its attacks, when it ceases for want of subjects on which to expend itself.

"Camp Diarrhœa" is one of those unaccountable, perplexing, annoying, and frequently obstinate maladies which all bodies of troops sooner or later suffer. To treat it successfully, and not decimate the strength of the command often baffles the best directed efforts and skill of the surgeon.

The history of modern wars has taught us the fact, that but few prophylactic measures are available to protect troops from this scourge, except such as may be enforced in the locations of permanent camps and their appurtenances; these at times, though not always, may protect the command during their stay, but the probabilities are that they will suffer on leaving such a post for a march of any length, or for change of location.

If we compare notes on those epidemic diarrhœas which so often prevail at different stations, among bodies of troops who are subjected to similar hygienic conditions in all particulars, we shall be very apt to find that would appear as a good cause for the appearance of the disease at the one post will not be found sufficient at another station. Therefore, a very narrow channel is left the surgeon under these

circumstances, to avoid grounding in his explanatory efforts; if we would steer clear in such cases, the utmost care will be required in weighing all the casual phenomena, real or apparent, before giving expression to an opinion as to the agencies that are or were active in inducing and propagating the malady.

It is much to be doubted that any surgeon is really able to give a valid reason for the appearance of "Camp Diarrhœa" one time in twenty instances of its occurrence, for it is induced by such a variety of occult causes of meteorological origin, which as a rule we have no means of appreciating, that no rules can be given for its attacks. Thus, on the Rappanannock, during the month of July, a portion of our troops had diarrhœa, while another body adjacent had intermittent, and still another portion had remittent fever; all of these troops were exposed to the same malarial agency, so far as could be discovered, yet how widely different were the maladies affecting these bodies of men from apparently the same hygienic conditions in all particulars.

How often have we seen a camp or barracks in the vicinity of a town, the troops and citizens living in their accustomed manner—under the same meteorological conditions: in the one place a violent diarrhœa suddenly prevails, while in the other the disease is absent. Such a case is not easily explainable. It may, perhaps, be an easy matter to account for the appearance of the disease among troops who have recently removed from one distant station to another post, and where a wide difference in the quality of their rations follows them, or equally wide differences occur in the climate of the respective stations; but on the other hand, it will be found not so easy to apply a cause for the same difficulty in a camp one-fourth of a mile distant from barracks which have been occupied by the same men for months using the same rations in kind as the late troops in camp, yet the same malady, with identical types makes its appearance at both stations.

In the case of the new troops the prevalence of the malady might seem attributable to a change of climate, rations, etc., and it would seem a good and sufficient reason; but this, it is obvious, will not explain the causes giving origin to the same type of disease in the older occupants of the adjoining barracks. The rule we might apply in the case of the troops in camp would not hold good for the others, for the reason that those agencies which may have affected the new men would not apply to the others.

If we would exclude that shocking term "contagion," which would be rejected generally in such cases, we shall be left in the

dilemma of choosing as a cause one of those "visitations of Providence," which covers much and explains nothing, or come up to the humiliating point and say at once, we are ignorant of the acting cause of "Camp diarrhœa" in nearly every instance in which it occurs; the latter is ordinarily the truth.

In this case, lest it might be understood as one of fancy, I will state that it is one of fact, and occurred at Camp Sumner and Presidio Barracks, in July, 1861. The troops at the camp were the 4th and 9th Infantry, U.S.A., and those at the barracks the 3d and 4th Artillery, U.S.A. The latter had occupied their post for a year and were thoroughly acclimated.

The troops at these places were comfortably situated, and their rations good, fresh meat and vegetables plenty. The epidemic here lasted eighteen days, made its full onset between two sick calls, and at the end of this period disappeared as suddenly as it came. The whole number of cases presented on sick report at Camp Sumner during this time was 157, the strength of the command near 400 men; of the number 157, there were 99 who had the disease. At the barracks the proportion was nearly the same.

On the third day from the announcement of the malady, I made a careful inspection of the food and quarters of the troops and found them good; the water used at the camp was from a spring near by, and no more saline than that used at the barracks; there was not sufficient cause here to account for the symptoms. The water was changed in some parts of the command, and the use of unripe and decaying fruit and vegetables rejected in the camp and barracks. Notwithstanding these and other preventive measures adopted, which seemed probable might stay the progress of the malady, I do not believe that all of them shortened the duration of the epidemic one hour.

I am in some doubt if the remedies used did much good after the attack, for some of the men who were sick and trusted to the "natural cure," it appears to me, got well nearly as soon as those who received medical treatment. Remedies *seemed* to control it readily, but it would recur in many cases after being completely checked to all appearance, would continue in spite of remedies for a time, and cease of its own accord.

Sub Mur. Hydrarg. Opii, Tannin, Plumbi Acetat, *Soda and Tinc. Opii* (the East India remedy), and the mineral acids, with various other *specifics*, in small, medium, and large doses, were used with the same *satisfactory* results. The epidemic began, ran through

its course, and cured itself in truth, but medicine of course received the credit of staying its progress.

On the 29th September, 1861, I took the medical charge of Camp Downey, which had been established on the 24th of the same month.

The troops at this post comprised the 1st Infantry California Volunteers: they were raw recruits from all parts of the State. A large proportion of these men were from the valley sections of the Sacramento, and another portion were from the mountain districts—but all of them from those parts of the State which, during August and September, has nearly a torrid climate. These men were transported from these warm regions during the period above-named, and placed in camp about the Presidio for two or three weeks prior to their removal to, and the establishment of, Camp Downey, in Alameda county.

A more bleak and unpleasant location than their first camp (Presidio) is not to be found in the State, except in the other wind-gaps of our coast, of which Presidio and its vicinity form one in the Coast Mountains, through which the cold sea-wind enters inland most furiously each day during this season of the year.

During their stay here, they suffered some from these chilling winds, and to which they were unaccustomed; beyond this, these men enjoyed tolerable health: the sudden and climatic changes to which they had been subjected affecting them but little beyond an ephemeral catarrh, which was of short duration. Their final removal to Camp Downey placed the troops in a more agreeable climate; and while here, up to the 4th September, no malady of an epidemic nature made its appearance among them. It will thus be seen that nearly all these men had been in camp life about four weeks, and were therefore fairly acclimated and habituated to this mode of living and service.

On the 4th September, an epidemic, "Camp diarrhœa," announced itself most suddenly. The following statement, in brief, will give some idea of the onset of the disease. Sept. 2d, my sick-report shows but one case diarrhœa. Sept. 3d, the sick-report contains but three cases of the same trouble; two of these three cases had eaten a meal of half-cooked beans, almost unmasticated, for they came away in that condition: a diarrhœa in these latter is, therefore, easily accounted for; the other patient could give no reason for his sickness.

Sept. 4th. This day my sick-report foots up 47 cases, and of this number *sixteen* cases came up for treatment with diarrhœa, a little more than one-third of all the cases on this day. The food of the regiment for the preceding two days had been fresh meat, vegetables



and fresh bread. There had been no extraordinary drilling, and the weather was mild on these days.

From these dates and details, it will be observed that the onset of the malady was sudden and equally surprising. The suddenness of the attack was equaled only by the violence of the symptoms of those on whom it seized.

This latter fact will be best illustrated by stating that all these men were obliged to go to the latrines as many as three times during the night, and a large proportion of them as often as every half hour during the same period. In the worst cases, the men were unable to reach the hospital quarters in the morning, without assistance, and one man was too low from its exhausting effects to be removed from his quarters till late in the afternoon. In five of these cases, they were unable to reach the sinks after three or four evacuations.

I beg leave, Sir, to ask your attention to this fact, viz.: that, excepting those cases previously mentioned as occurring on the 2d and 3d Sept., the sixteen men who came up on the 4th with diarrhœa, were to all appearance (and so far as they themselves know) in robust health the day previous; they performed their duties as usual; were living upon the same rations as for days preceding; there was nothing in or about the camp twelve hours before its attack that would in the slightest degree indicate the condition of health, or rather disease, which manifested itself on that morning. On the fourth day of the epidemic, myself and assistants were also seized. I mention this latter fact to show that officers were no more exempt than the men; it therefore could not have arisen from those indiscretions to which troops are liable, for those are not frequently indulged in to the same extent, at least among the officers, as among the others; so far as the hospital corps was concerned, nothing had occurred in our dietary or exercise to induce it.

During the day of the 5th Sept. I took the opportunity that occurred to examine the character of the alvine evacuations of some of the cases, and also to note more carefully the other symptoms attending the sickness.

In all the cases the discharges were frequent, copious, and *white*, with shreddy and tenacious mucous commingled, and shining roundish glassy grains; in other cases they were mucoid, shreddy and watery, with much flatus accompanying. A portion of this latter form on agitation with water would sink; this was the case only with those on whom the attack was mildest. In the others, as the discharges indicate, the malady was much more *severe*, expending its force not only on the mucus membrane of the intestinal track appar-



ently its entire length, in some cases, but also on the mucus glands of the stomach and the follicles of the small intestines.

Although the above points afford us data on which we may speak positively as to the individual parts affected in this epidemic, it does not furnish us the slightest clue to the peculiar agency or its action that should thus so suddenly and violently disturb the whole course of the digestive organs.

A few of these took on true dysenteric action, and which was also complicated with follicular trouble, thus making their cases tediously convalescent.

Nausea was a constant symptom, coldness of the surface and a corrugated skin; the men often used their blankets, and would seek the sunny positions about the camp quarters; those in hospital preferred, and would remain in bed covered in their blankets, with their heads *under* the bed-clothing.

Epigastric pain and tenderness with severe cramping (as the men described it, "in the bladder") in the pubic region and colon of the left side; the bowels were more or less tender on pressure or percussion, at any point they were examined. Such, in brief, are the symptoms which attended the cases who suffered from its attack, augmented or diminished according to its severity.

There are other features attending this epidemic which I consider as worthy of notice: they are those relating to the suddenness with which the patients were seized, and the immediate prostration which ensued; in some of the cases the latter was as rapid and complete as I have seen it in cholera.

Thus I have known men taken immediately after eating, without any premonitory symptoms; on parade and at drill they would fall as suddenly as though shot through the body; six cases of this nature occurred in four days. The case of Lieut. Baldwin, of the Cavalry, was one of those very sudden and violent attacks. After he was placed in hospital the vomiting and purging was almost incessant for six hours, and it was one of the most stubborn to yield during the epidemic.

One other case will also be mentioned, that of a sentry near the hospital quarters. I had been awake for half an hour before day-break and heard the patrol of the man near my tent; he suddenly fell to the ground. When I reached him I thought him dead, for on shaking him he gave no sign of life; on lifting him to his knees, and again shaking him, he gave the first sign of returning consciousness. A relief guard was called, but before he arrived, vomiting and purging came on, and the cause of the trouble was apparent.

The epidemic continued from the 4th to the 23d Sept., but was much diminished in violence by the 16th; there were no new cases after the 23d.

Most of the sixteen cases of the 4th Sept. were placed on astringent anodynes and quinine; five were treated with Sub Mur. Hyd. gr. x, Opii pulv. gr. ii; one case, a bad one (private Kelly), belonging to Capt. Roberts' company, was placed upon Bismuth Sub Nit. gr. xx, Sub Mur. Hyd. gr. x. This man was so far reduced in strength during the latter part of the night that he was unable to leave the sick without assistance. Those cases placed on astringents in heavy doses with anodynes and quinine, were merely checked; in none had the discharges ceased on the following day: the pain in all was mitigated, this seemed about the only advantage gained. The cases under Sub Mur. Hyd. et Opii did no better, if quite as well, for two of these five cases were placed in hospital on the 5th. I think the trouble was aggravated by these remedies. The case of Kelly came up on the next day with the diarrhœa entirely stopped, but suffering from extreme weakness.

As there was some mitigation during the first day in the patients treated with astringents, etc., it was determined to continue these remedies, with such slight alterations as might seem required. On the following day there was still some improvement; the cases looked fair for a slow recovery, which proved to be the case in all thus treated. They were on sick report from six to ten days. The treatment gave me no better satisfaction than when used at Presidio in July; it was, therefore, abandoned, as was also the mercurial method which, in the five cases in which it was used, gave no advantageous results.

In the case of Kelly, the relief afforded by the Bismuth et Hydrag, was so prompt and radical, that it led me to the immediate adoption of this course of medication, and for this reason: the irritable condition of the stomach and intestinal track was overcome by the use of this drug, a point not easily gained by all the other methods of treatment that had been pursued, except for a temporary period. From the 4th Sept. the Bismuth was given freely, alone and combined. The quantity used varied from ten to fifty grains at one dose. In some of the cases the Sub Mur. Hydrag. in three to ten grains was combined. In all the cases in which Bismuth alone was used in gr. xx doses, the discharges were ordinarily arrested without other remedies, the pain and flatulence also ceased in a few hours; at the end of forty-eight hours after this treatment the men often required a laxative to open the bowels.

When the Sub Mur. Hydrarg. was combined in a dose of ten grains, no laxative was requisite; but when this remedy was less than six grains, the requirement for a laxative at the end of twenty-four hours was not infrequent.

The total number of cases submitted to the treatment of Bismuth combined and alone, at Camp Downey, number seventy-eight; the total of all the cases of diarrhœa from the 4th Sept. was ninety-four. The strength of the command during the period of the epidemic was five hundred rank and file.

The following are the statistics of the treatment as appears on my sick-report, derived from entry, and return to duty.

Between the 4th Sept. and the 22d, nineteen cases took the following for diarrhœa: Bismuth Sub Nit. gr. xv, Sub Mur. Hydrarg. gr. x. No other remedy. These cases returned to duty at the end of twenty-four hours.

There were eight cases who took the following: Bismuth Sub Nit. gr. x, Sub Mur. Hyd. gr. x. The diarrhœa was arrested in thirty-six hours on an average. There was much nausea in some of these cases after this remedy had been taken, and, when it occurred, the patient had not more than three evacuations until twelve or fifteen hours afterwards; the discharges were then free, and usually amounted to four or five in number, and taking place at lengthening intervals. The first two discharges occurring at the end of this period were dark and tar-like; those which took place later were yellowish and slightly green. In four of these eight cases, the green color in the feces proceeded from *altered blood* alone. On the second day a light dose of oil was given, and these men returned to duty. The 27 cases here enumerated had the disease in its moderate form.

There were twelve cases in which Bismuth alone was given in doses of twenty grains. In all these the diarrhœa was promptly arrested within the day; not one of those men went to the sink after night.

Within six hours after the exhibition of the remedy, the abdominal pains and flatulency ceased, and the men obtained sleep without the use of opiates; all these cases required a mild laxative on the following day, which was followed by one full and dark stool, and ordinarily two lighter ones within the twelve hours; they were returned to duty the following day.

In fourteen cases with whom the disease was more severe, the following prescription was given: Bismuth Sub Nit. gr. xxv., Sub Mur. Hyd. gr. x. In the greater portion of this number there was much nausea following the use of the remedy, and which came on

between one and two hours after it was taken. The diarrhœa was soon subdued, and with it the attending pain; this took place commonly within nine hours. In six of these cases the discharges continued until tattoo, but there were none after that hour; there were five others in which no movement of the bowels took place after the lapse of six hours. In four of these cases a laxative was required on the second day, from the action of which from three to four passages followed; most of these cases returned to duty on the third day, and all of them on the fourth day from the beginning of the treatment.

In seventeen cases similar in character to the preceding, the same quantity of Bismuth was given, with one-half the quantity, gr. v Sub Mur. Hyd. There was but one of this number who had any nausea after taking the remedy. The diarrhœa in all of these men was arrested during the day. In eight cases a laxative was required on the second day; all these patients but one returned to duty on the third day.

In five cases on whom the malady was very severe—in which the discharges occurred each hour, with vomiting and nausea, as well as extreme prostration—the quantity of Bismuth exhibited was forty grains, with Sub Mur. Hyd. grains three, at a single dose; in each the evacuations were promptly arrested, with the subsidence of the gastric disturbance. There were also three other cases in which fifty grains of the remedy as above was given. In all these eight cases there was no movement of the bowels at the expiration of eight hours; all of them required a laxative at the end of twenty-four hours.

Having thus observed the therapeutic effect of the Sub. Nit. Bismuth on the seventy-eight cases above noted, where the diarrhœa existed as an epidemic, and in the acute form, it became a matter of no little importance to consider how far it might be applicable in chronic cases among men who did not enjoy the maximum standard of health, and who were suffering not only from a reduction of the powers of vitality induced from disease and an arduous campaign, but also from wounds of various descriptions and severities.

While stationed at Finley Hospital, as Surgeon-in-charge, in August and September, a series of cases under these conditions presented themselves, the greater portion of which had their origin on the peninsula after the movement of the army of the Potomac toward Richmond; some of the men had contracted the malady prior to their leaving the vicinity of the river, and notwithstanding its continuance kept on their marching until, in consequence of absolute prostration from the effects of its constant drain, they were obliged

to fall in the rear of the columns and finally, by slow and reverted steps, reached the hospitals at different points of their backward journey.

This is not the proper place to discuss the merits and demerits of the military hygiene of the army after it left the river on its march over the peninsula, by one who did not accompany the campaign; I feel authorized to speak only of the condition of the men after they were received into hospital for treatment. Suffice it to say, that this malady most seriously modified all other complaints with which the men were affected, so much so that the specific treatment for other diseases often proved abortive. A number of these cases took on the typhoid condition and died, while others most manifestly exhibited the existence of a greater or less amount of intestinal lesion, which clearly accounted for the low *status* of health found in these men. Coupled with this accident was a scorbutic condition, which, in many cases, was highly developed, no matter from whatsoever portion of the army the patient may have come.

Among the wounded from Fair Oaks, Cedar Mountain, the battles of the 29th and 30th at Bull Run, from Sharpsburg and Antietam, the depressing influence of this systemic poison was severely felt; and we thus had not only the reducing agency of the diarrhœa to combat, but also the baneful influence of this poison, which affected the condition of all the wounds.

That this low state of health did really exist among the troops as a systemic trouble, and that it needed but an active cause to call it forth, will become apparent from the following statement: The number of wounded at the Finley Hospital received from the above battles was *three hundred and eighty-eight*, and of this number *one hundred and eighty-two* had diarrhœa in some one of its chronic stages; a very few only had the acute form, and which was usually traceable to some immediate causes when it occurred. More conclusive will the fact appear when we notice the proportion in which the malady was present among the wounded, to those cases occurring among the general sick. The whole number treated for diarrhœa during August and September, at the Finley Hospital, was two hundred and seventy cases; the total of admissions to the wards from August 5th to Sep. 25th being 1,774; of wounded there were 388 cases, leaving 1,385 of general sick; among the latter we have but eighty-eight cases of diarrhœa, against *one hundred and eighty-two* among the wounded. Thus our wounded, like the wounded of other armies whom we know were badly cared for in their rations and general health, suffered from like maladies induced from analogous



causes. The prevalence of these intestinal troubles among the troops of itself speaks a volume on the hygiene of our veteran soldiers of the peninsular campaign. On whom the responsibility of such a condition rests I will not here discuss, but it would certainly seem to merit the attention of the chief of the medical corps, to this extent at least, that a more rigid discipline be hereafter enforced by his subordinates who have the care of the health of our troops in the field.

Respecting those cases which had assumed a typhoid condition on their admission into the Finley from the hospitals of Alexandria and also from the field hospitals, and who had passed beyond the reach of medical relief, there is but little to record beyond the fact that these men died; on three of them only was Bismuth used, but it did no good, except for a temporary period; the disease went on to a fatal termination. These cases, therefore, are not included in our figures, for no effort was made to save them by that means, but simply to sustain their waning lives by nutrients, and tonics and stimulants, until death relieved them of their troubles.

It must be borne in mind that the invalids at the Finley Hospital who suffered from diarrhœa, and who were subjected to the treatment by Bismuth for that disease, were men who possessed a much lower condition of health than the raw recruits belonging to the California Volunteers; and farther, that all the evidences at our command lead to the conclusion that the causes giving origin to the disease in the one case, were not in any way analagous to that which produced it in the cases of the other troops.

The disease also varied: among the troops on the west coast it was extremely acute in all; but in those on the Atlantic side there were but a comparatively small number of cases of this character. Thus of the 270 cases there were but 39 in whom the disease had existed from one to nine days: in all the others the malady appears to have been light at first and increasing in severity by time. Of the acute cases, there were 26 to whom sixty grains of Bismuth were given at a single dose, and 13, the remainder, received forty-five grains each. In all the discharge ceased within twenty-four hours, and there was no return of the symptoms.

Where the malady had existed over nine days, I regard it as belonging to the chronic stage, and use it as such. The number of patients on whom it has continued from ten to twelve days, was one hundred and fifteen; of this number seventy-five took Bismuth in doses of sixty grains, each day, at one dose; the longest period of the continuance of the diarrhœa was four days, the shortest period one day: Of the seventy-eight remaining, seven cases took each day



eighty grains at one dose; the discharges ceased entirely in all on the fourth day. The remaining seventy-one took the same quantity of Bismuth in forty grain doses twice a day, with an average result of four and one-half days to the cessation of the evacuations from the period at which the remedy was first given.

All that remain had the disease from twenty to two hundred ten days; these foot up seventy-four cases. There were eleven of this number on whom it had existed from ninety-four days to the longest period named.

With the exception of the latter, these men were treated with doses of sixty grains daily; a few of them took eighty grains in divided doses for one or two days. The average period of the treatment was five and one-half days, at which time the discharges ceased permanently. There were none of these cases that had less than six movements of the bowels within twenty-four hours, and in many of the cases they were nearly or quite doubled.

In the eleven cases above alluded to, our treatment varied somewhat from the rigid rule adopted in the cases which preceeded them. This became necessary as a serious doubt arose as to how far their reduced forms and vitality would withstand these apparently heroic measures. One of these cases was selected on whom the disease had been present four months (and who was fast sinking in strength from its exhausting effects), as a suitable subject on which to determine by experiment the propriety of pushing the large doses of Bismuth.

This, however, was not attempted and entered upon before he had received a fair trial with other remedies for seven days after his admission into the wards. This man was a transferred patient from one of the hospitals of Alexandria, with several others, in the early part of September; he had been in hospital at that place for sixty days previous; he reports that he contracted the malady on the peninsula about two months prior to his being invalided at Alexandria. This patient during his sickness at the Findley Hospital occupied bed No. 45, Ward 3.

He was emaciated and weak, and notwithstanding every means was adopted during the first week of his stay in these wards, the disease maintained a stubborn persistence; the passages were eight or more each day, were mucoid and watery, occasionally bloody, attended with pain and tenesmus. There was nothing that seemed in the least to ameliorate his symptoms in the shape of medicine during the above period. As but a meagre prospect of his recovery was present from the effects of varied medication which had been adopted with him,

it was determined to make him the subject of a direct experiment with the Bismuth in large doses.

On the 13th Sept. he received forty-five grains of Bismuth at one dose; the stomach tolerated the remedy, and although no unpleasant effect followed, still there was no evidence on the following day that it had in the slightest degree affected the intestinal trouble. On the 14th, eighty grains were given, with no perceptible benefit at the end of twenty-four hours. On the 15th, the same dose was repeated; during the night there was a mitigation of the pain and tenesmus at stool, and he was up but twice during the night; on the following forenoon he had but one passage, less copious than the night previous, and without pain; the stool was of a dark color. During these twenty-four hours there had been but five evacuations, and the patient had obtained some sleep. As the remedy appeared to have exerted its specific effects and in a kind manner, it was not deemed prudent, from the low state of the patient, to push it too rapidly, and on the 16th the quantity was reduced to forty-five grains. There was no passage during the night, and the patient slept well; the bowels moved but four times during the day.

On the 17th, the patient had two evacuations during the night and three during the day, and on account of this change for the worse during the last twenty-four hours on the forty-five grain dose, the remedy on the 18th was increased to sixty grains with the effect of diminishing the number of discharges to two only.

On the 10th and 20th, he received each day eighty grains. On the night and day following, there was no movement of the bowels, nor was there the slightest disposition, which was the first time this had occurred in four months. During the day some flatus passed off much to the astonishment and delight of the patient.

On the 21st, the remedy was again reduced to forty-five grains, which amount he received daily until the 26th, when medication for the diarrhœa was suspended as the disease had ceased. This man made a good recovery from his sickness.

In consequence of the favorable results from the use of the Bismuth on this patient, there was no hesitancy in adopting the same measures with the others; and after the 16th they were placed on the same course of treatment. One man on whom the malady had persisted for the period of *two hundred and ten days*, had the disease arrested entirely at the end of thirteen days from the beginning of the treatment. This patient was also in Ward 3, but the number of his bed is lost; he was under the care of Assist.-Surg. Keyes, as was also the preceding one. There is still another of these chronic cases that deserves mention; the patient was in Ward 6.

This man had diarrhœa for one year, and was much emaciated; his passages for a long period prior to his admission to the Finley Hospital, had varied from four to six and more each day. He was placed on the Bismuth in doses of three scruples at once for the first three days; at the end of this period the bowels moved but three times in the twenty-four hours; on the fourth day the remedy was increased to four scruples, one-half taken morning and evening. At the end of the fourth day, the bowels acted but twice in the twenty-four hours. He was placed on forty-grain doses twice a day for the balance of the period in which any diarrhoid was manifest; he was under treatment fifteen days, at which time the trouble ceased. The smallest quantity of Bismuth taken by this patient during twelve hours was one drachm. This patient was under the care of Assist.-Surg. I. W. McLean, himself an invalid at the Finley with the same disease, and on the same treatment.

Both patient and medical attendant made good recoveries, the latter particularly, as the commissary of the Hospital can well attest.

In regard to the other nine cases on whom the diarrhœa had been present more than three months, a general statement will suffice and save repetition: their treatment was continued with the same remedy and in the same quantities. In all the cases a full dose of three scruples was given each day: this quantity was never divided when prescribed for that period; but when four scruples was prescribed, it was most commonly divided for the convenience of exhibition. When the forty grain doses were given the patient usually took both within eight hours; there were occasional instances where the period elapsed was twelve hours between the exhibitions of the medicine.

From the remarks on a preceding page, it will be seen that the remedy would have full time to exert its specific effect within the first periods named, as little, if any relief, followed its use in the acute cases as a general fact in less time than six hours.

In brief, I will now give the original notes on three additional chronic cases, whom I placed under the charge of Assistant-Surgeon J. W. McLean, and which will be amply sufficient to show the effect of the remedy, as well also of the method of exhibition.

CASE 8.—One year standing, four to eight passages a day. Has averaged six passages for four days. Ordered Bismuth, scruples three, at one dose; same quantity continued for three days. Passages at end of this time are three in twenty-four hours. Ordered eighty grains at one dose. At the end of four days the evacuations are two in twenty-four hours. Ordered four scruples in divided doses of forty grains each; at the end of four days the discharges ceased entirely. Period of cure, eleven days.

CASE 2.—Two and a half months standing. He averages nine evacuations a day. Ordered thirty grains of Bismuth at one dose; continued for three days; passages six a day. Ordered three scruples a day at one dose; continued for four days, when the disease ceased entirely. Period of cure, seven days.

CASE 5.—Three weeks standing. Has averaged twelve passages a day for four days. Ordered four scruples Bismuth. On the second day the passages were seven in number; on the fifth have not become less. Ordered two scruples each four hours. On the seventh day the cure was complete. Period of treatment, seven days.

All of these cases were transfers from the Alexandria and other hospitals, where they had been invalids for various periods. And here it becomes necessary to state that to all appearance the recoveries were radical, for the men soon gained flesh and strength after the cessation of the malady.

In the chronic cases under consideration, the time required to effectually and radically suspend the intestinal flux with the Bismuth varied from six to thirteen days, and although using the remedy in heavy quantities, there was not observed the slightest unpleasant symptom following its exhibition. In no case did we find that *weight and oppression* in the stomach, nor any other of the list of evils noticed in the books following our four scruple doses, much less our smaller doses, which were ordinarily little more than double the quantity which some of our dispensaries teach us are productive of such results.

I have detailed but a few of the cases, and those only to show the manner of prescribing this agent, but more particularly to exhibit the necessity of using it *freely* if it be used in this malady, rather than in the minimum quantities in which it is ordinarily prescribed. If it is to be made effectual in these accidents, it must be not used in pharmacopeal amounts, as the cases in which small doses were administered most fully prove; in all these it became necessary to give the maximum dose finally before the evacuations were arrested.

In a great majority of those cases on whom the malady had continued to twenty days, a single dose of four scruples would arrest the discharge within one full day; while in others, and not in few, the same quantity daily given, but divided into four doses, often failed to stop the flux in three to six days. In others again who had the disease ten days, and who took three scruples at one dose, the discharges were always promptly checked; while the same quantity divided into four equal parts and given during a day produced no favorable result. In Ward No. 1, beds 65, 27, 34, 13, 22, and Ward No. 2, beds 69, 4, 5, 82, 39, furnish examples of the minimum method of

treatment. It may become necessary here to state, that this report is founded on the daily account of Bismuth dispensed by Acting-Steward Noe, after my order directing this malady to be treated with this agent alone at the Finley Hospital. The account is in tabular form, and contains the ward, bed, dose, surgeon, date of commencement and termination; from its great length its publication is here omitted. I take pleasure in returning my thanks to the dispensing clerk, Mr. Noe, in this place, for the care he bestowed in this matter and his accuracy. This will be sufficient to set aside any doubts that might arise as to our figures, and on this basis I ask that the statements herein contained be received as statistical facts.

I am well aware, Sir, that in statements of this character, one is liable to incur the risk of being denominated a heroic practitioner, and also of following an unreasonable or a groundless hobby. I have, therefore, been particular in placing this in a statistical position, rather than to deal with the subject in a more general manner, unsupported by facts and figures; and in what may be said of the results of this practice below, I am desirous that neither of these charges shall rest.

With the evidences before us touching the therapeutic action of Bismuth in the acute and chronic stages of diarrhœa, and in climates widely distant and diverse,—the malady having its origin from different causes—on men enjoying the maximum of health at its advent on the one hand, on the other its attack and continuance on troops reduced to the minimum of health compatible with duty—suffering from the depression of wounds and their suppurating process, or reduced from the fatigues of the field and bad living, or with the complications of other diseases which had arisen in these trains of ills, if there is any one remedy entitled to the appellation of *specific*, in such cases it is the remedy of which we speak. This will the more strongly appear when I state without qualification, that, (with the exceptions made on a preceding page of those low and nearly moribund cases of a typhoid character,) *in not a case of the two hundred and seventy treated at the Finley Hospital during the period named and by this agent, was there a failure in promptly and radically arresting the disease when given in the quantities and time as stated.*

Add to these the cases at Camp Downey, Cal., ninety-four in number, and we have a total of three hundred and sixty-four almost consecutive cases, on which to found an opinion. I am aware that this is saying very much, but as the facts and figures warrant it, it is but proper to speak as they will authorize.

The question may be asked, as to how far the dietary of these



men in wards may have influenced the cure of these accidents; over the dietary of the field our ward-fare and accommodations undoubtedly had advantages; but as you, Sir, well know, the general rations of our Military Hospitals in the District of Columbia, you can easily judge how far government rations and a small hospital fund (portions of which latter were diverted to pay Quartermasters' orders and never refunded) could influence the result. I can simply say, that nothing unusual nor extraordinary was given these men as food, though the patients at Finley, I believe, lived as well as those of any other hospital in the District and as well as circumstances would permit.

From the cases here presented, it must be admitted that the Bismuth exerts a kind effect and becomes a safe and expeditious curative agent in these maladies, but its mode of action is complex and not easily explained. I will not attempt to make this point more lucid farther than by a few observations on the subject under its influence. To me it appeared to act as a direct sedative, first upon the stomach, quieting the irritability of the gastric catarrh *always* present in these cases. When rejected by the stomach, it leaves this organ in an uncolored state, therefore any chemical change that may here ensue cannot be demonstrated except by analysis. Commonly, three and four hours would elapse from the time it was taken before any notable effects would be observed along the intestinal canal. And here its action was equally marked in these viscera as upon the stomach. If an opinion could, with propriety, be advanced from the above, it would be, that the remedy first becomes basic in the stomach, to which its subsequent action in the small intestines is due, for it would be difficult to reconcile the idea that it passes into and through these viscera in that form in which it is taken; if the latter be the fact, we shall find a greater difficulty in accounting for the form of sulphide in which condition it leaves the body.

I do not propose that any new treatment is herein indicated in the use of free doses of Bismuth in Diarrhœa, for a remedy so well known for near four centuries has probably traveled through many of those vicennial cycles to which medicine is liable, has played its part for the time, and has failed and again succeeded, has been again rejected and forgotten, as this will probably be when some other may use it equally free as myself, and apparently under analogous circumstances, and may not find it answer the requirements of the malady that may be present. If any claim is set up in this case, it would be simply the revival and very free use of an old and valuable remedy, whose properties in troubles of this character seems to have been overlooked.

Thanking you for the many kindnesses received at your hands, I remain, very respectfully, yours, etc.,

JOHN B. TRASK, M.D.

SAN FRANCISCO, April, 1863.